Message (Digitally Signed)

From: Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) [derek.j.robinson1@navy.mil]
Sent: 8/12/2019 2:21:50 PM
To: Praskins, Wayne [Praskins.Wayne@epa.gov]
CC: Stoick, Paul T CIV USN (USA) [paul.stoick@navy.mil]; Liscio, Matthew P CIV USN NAVSEA DET RASO VA (USA) [matthew.liscio@navy.mil]
Subject: HPNS Building Risks at RGs
Attachments: RESRAD BUILD HPNS Risks_ROCs at RGs_8Aug19.xlsx; smime.p7s

Hi Wayne,

<<...>>

Below and attached are our initial risk estimates and assumptions for exposures at the RGs for child residents, adult residents and commercial (indoor) workers. I am hoping that you can have your technical expert review this and then we can have a conference call to talk over any questions. If this sounds good to you, please let me know when you will be ready to talk.

I am open to other suggestions. As always, feel free to give me a call if you want to discuss.

Derek

ASSUMPTIONS -

All estimated risks (at time = 0) use the described site-specific parameters.

The following changes from defaults were used in RESRAD-BUILD 3.5:

Child resident exposures

- Exposure duration = 365 d/y x 6 yr = 2190 d

- Indoor fraction = 50 wk/y / 52 wk/y = 0.96

- Time fraction (time in compartment; time exposed to source) = 16 h/d / 24 h/d = 0.67

- Breathing rate = 10 m3/h (EPA Exposure Factors Handbook, 2015, Table 6-1)

- Ingestion rate = 0.0002 m2/h (RESRAD default for adults is 0.0001 m2/h; EPA Exposure Factors Handbook, 2017, Table 5-1 indicates child rate is twice that of adult)

- Receptor location = 5m, 5m, 0.5m (assume toddler breathing zone is half height of adult)

- Area source in z-direction at 5m, 5m, 0m

- Removable fraction = 0.2 (20% to match assumption used in HPNS 2006 Action Memorandum to generate current RGs)

- Lifetime = exposure duration = 2190 d (source concentration is reduced through exposures, cleaning, foot traffic, etc. and assumed to decrease linearly over entire exposure duration)

- Th-232 and Ra-226 modeled with daughters in secular equilibrium

Adult resident exposures

- Exposure duration = 365 d/y x 25 yr = 9125 d

- Indoor fraction = 50 wk/y / 52 wk/y = 0.96

- Time fraction (time in compartment; time exposed to source) = 16 h/d / 24 h/d = 0.67

- Breathing rate = 16 m3/h (EPA Exposure Factors Handbook, 2015, Table 6-1)

- Ingestion rate = 0.0001 m2/h (RESRAD default)

- Receptor location = 5m, 5m, 1m

- Area source in z-direction at 5m, 5m, 0m

- Removable fraction = 0.2 (20% to match assumption used in HPNS 2006 Action Memorandum to generate current RGs)

- Lifetime = exposure duration = 9125 d (source concentration is reduced through exposures, cleaning, foot traffic, etc. and assumed to decrease linearly over entire exposure duration)

- Th-232 and Ra-226 modeled with daughters in secular equilibrium

Indoor worker exposures

- Exposure duration = 365 d/y x 25 yr = 9125 d

- Indoor fraction = 50 wk/y / 52 wk/y = 0.96

- Time fraction (time in compartment; time exposed to source) = 8 h/d / 24 h/d = 0.33

- Breathing rate = 16 m3/h (EPA Exposure Factors Handbook, 2015, Table 6-1)

- Ingestion rate = 0.0001 m2/h (RESRAD default)

- Receptor location = 5m, 5m, 1m

- Area source in z-direction at 5m, 5m, 0m

- Removable fraction = 0.2 (20% to match assumption used in HPNS 2006 Action Memorandum to generate current RGs)

- Lifetime = exposure duration = 9125 d (source concentration is reduced through exposures, cleaning, foot traffic, etc. and assumed to decrease linearly over entire exposure duration)

- Th-232 and Ra-226 modeled with daughters in secular equilibrium

Radionuclide	RG (dpm/100 cm2)	Input Concentration (dpm/m2)	Child Resident Risk	Adult Resident Risk	Indoor Worker Risk
Am-241	100	10,000	4.75E-07	7.52E-07	3.70E-07
Cs-137	5000	500,000	2.46E-05	3.76E-05	1.85E-05
Co-60	5000	500,000	4.19E-05	5.01E-05	2.47E-05
Eu-152	5000	500,000	2.45E-05	4.42E-05	2.18E-05
Eu-154	5000	500,000	2.46E-05	3.76E-05	1.85E-05
Pu-239	100	10,000	6.71E-07	1.05E-06	5.17E-07
Ra-226+D	100	10,000	1.67E-06	3.68E-06	1.81E-06
Sr-90	1000	100,000	1.73E-07	1.63E-07	8.03E-08
Th-232+D	36.5	3,650	1.53E-06	4.08E-06	2.01E-06
H-3	5000	500,000	1.26E-09	8.27E-10	4.07E-10
U-235	488	48,800	1.91E-06	3.46E-06	1.70E-06